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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,793	10/30/2003	Yoshiyuki Ikuma	244669US2	7748

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EXAMINER

PHU, SANH D

ART UNIT PAPER NUMBER

2618

DATE MAILED: 04/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/695,793	IKUMA, YOSHIYUKI	
	Examiner	Art Unit	
	Sanh D. Phu	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13 is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/30/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The IDS filed 10/30/2003 has been considered and recorded in the file.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

3. Claim 16 is objected to because of the following informalities: the limitation "the receiving signal" is lack of antecedent basis. Appropriate correction is required.

Claim Rejections – 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 8-10, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawanami et al (5,896,563).

-Regarding to claim 1, Kawanami et al discloses transmitting/receiving module (see figure 1) comprising:

a first amplifier (6) which amplifies a transmission signal (see col. 4, lines 59-60);

a second amplifier (7) which amplifies a receiving signal (see col. 4, lines 61-62); and

a low reflection power limiter (10, 11) provided on an input side of said second amplifier for limiting (by switching off) power flowing into the second amplifier when a transmission signal is outputted (see figures 1, 2A, col. 4, line 66 to col. 5, line 6, col. 5, lines 50-60).

-Regarding to claim 2, Kawanami et al discloses that the transmission signal is radiated into an air from a radiator (2) externally arranged in

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association with the transmitting/receiving module and the receiving signal is received by the radiator (see figure 1, col. 4, lines 51–54).

–Regarding to claim 3, Kawanami et al discloses a circulator (9) having a first terminal, a second terminal and a third terminal, wherein the transmission signal (outputted from the first amplifier (6)) is inputted to the first terminal, the receiving signal is received from an antenna system (2, 5) through the second terminal, the third terminal is connected to the second amplifier (7) and the low reflection limiter is provided between the circulator and the second amplifier (see figure 1).

–Regarding to claim 4, Kawanami et al discloses that said low reflection limiter (8, 10) can be configured to comprise a limiter diode (D7, D8) and a resistor (11), which are connected in series with each other (see figure 2A, col. 5, line 7 to col. 6, line 15).

–Regarding to claim 5, Kawanami et al discloses that said low reflection limiter can be configure to comprise a plurality of series connection circuits, each of which comprises a limiter diode and a resistor (51 ohms) connected in series with each other, and at least one quarter–wavelength line (L) provided

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between adjacent two series connection circuits of said plurality of series connection circuits (see figure 3, and col. 6, lines 16–26).

–Regarding to claim 8, as similarly applied to claims 1–3, see figures 1, and col. 4, line 45 to col. 5, line 6, Kawanami et al discloses a transmitting/receiving module (see figure 1) comprising:

- a first amplifier (6) which amplifies a transmission signal;
- a second amplifier (7) which amplifies a receiving signal;
- a low reflection limiter (10, 11) provided on an input side of said second amplifier,

in which the transmission signal is radiated into an air from a radiator (2) externally arranged in association with the transmitting/receiving module and the receiving signal is received by the radiator; and a circulator (9) having a first terminal, a second terminal and a third terminal, wherein the transmission signal (outputted from the first amplifier (6)) is inputted to the first terminal, the receiving signal is received by the radiator connected to the second terminal, the third terminal is connected to the second amplifier, and the low reflection limiter is provided between the circulator and the second amplifier.

-Regarding to claim 9, as similarly applied to claim 4, Kawanami et al discloses that said low reflection limiter can be configured to comprise a limiter diode (D7, D8) and a resistor (11), which are connected in series with each other (see figure 2A).

-Regarding to claim 10, as similarly applied to claim 5, Kawanami et al discloses that said low reflection limiter comprises a plurality of series connection circuits, each of which comprises a limiter diode and a resistor (51 ohms) connected in series with each other, and at least one quarter-wavelength line (L) provided between adjacent two series connection circuits of said plurality of series connection circuits (see figure 3).

-Regarding to claim 14, Kawanami et al discloses a low reflection limiter (10, 11) comprising: a limiter diode (D7, D8); and a resistor (11) having one end, which is connected to the limiter diode, and another end, which is grounded (see figure 2A, and col. 5, lines 7-16).

-Regarding to claim 15, Kawanami et al discloses a low reflection limiter (see figure 3) comprising: a plurality of series connection circuits, each of which comprises a limiter diode and a resistor (51 ohms) connected in series to the

limiter diode and having one end grounded, and at least one quarter-wavelength line (L) provided between adjacent two series connection circuits of said plurality of series connection circuits (see col. 6, lines 16–26).

6. Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Vagher (6,362,685).

–Regarding to claim 16, Vagher discloses a low reflection limiter (850) (see figure 8) comprising:

a directional coupler (823) having a first terminal (in) to which a receiving signal, being received by low reflection limiter, is inputted, a second terminal (ISOL), a third terminal (out 90) and a fourth terminal (out 0); a terminating resistor connected to the second terminal (ISOL) of the directional coupler; a first limiter diode (875) connected to the third terminal of the directional coupler; and a second limiter diode (874) connected to the fourth terminal of the directional coupler (see col. 5, line 61 to col. 6, line 32, col.7, lines 45–58).

Claim Rejections – 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 6-8, 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art, admitted by the applicant in the specification of the instant application (hereinafter referred to as "admitted prior art"), in view of Vagher.

-Regarding to claim 1, the admitted prior art (see figure 5 and page 1, line 23 to page 4, line 1 of the specification) teaches a transmitting/receiving module comprising:

a first amplifier (53) which amplifies a transmission signal in a transmit path; and

a second amplifier (56) which amplifies a receiving signal in a receive path.

The admitted prior art does not teach a low reflection limiter provided on an input side of said second amplifier, as claimed.

Vagher teaches a low reflection limiter (850) which is capable of limiting (by switching off) an unselected input signal received from an input terminal (in) of device (823) of the low reflection limiter for flowing into an output path (LOW POWER PATH) at an output terminal (out 90) of device (843) of low reflection limiter, (see col. 5, line 61 to col. 6, line 32, col.7, lines 45-58).

In the admitted prior art, the transmitting/receiving module operates in a transmit mode when switch (52) switching to a transmitting side (Sa) of the transmit path for transmitting a transmitting signal onto the circulator (54) and the antenna (55) out to the air, and in a receiver mode when switch (52) switching to a receiving side (Sb) of the receive path for receiving a return signal received from the antenna and the circulator (see figure 5 and page 1, line 23 to page 4, line 1 of the specification). In the admitted prior art, the second amplifier (56) in the receive path is vulnerable for receiving some possible leakage power of the transmitting signal being leaked through the circulator in Y direction during the transmit mode (see page 2, lines 5-11), wherein these leakage power, as a signal received by the second amplifier and

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if large enough, might cause damage to the second amplifier (56) (see page 3, lines 12–16).

It would have been obvious for a person skilled in the art to implement the admitted prior art with a low reflection limiter, as taught by Vagher, in such a way that a low reflection limiter provided on an input side of the second amplifier, between the said second amplifier and circulator with its input terminal connected to the circulator and its output terminal connected to the second amplifier, wherein the low reflection limiter would be configured to limit (by switching off during the transmit mode) leakage power of the transmitting signal being leaked through circulator for flowing into the second amplifier so that possible damages which might be caused to the second amplifier by these power leakages would be avoided.

–Regarding to claim 6, the admitted prior in view of Vagher teaches that said low reflection limiter can be configured to comprise a first directional coupler (823); said first directional coupler having a first terminal into which a receiving signal, received from the circulator, is inputted, a second terminal (ISOL) connected to a terminating resistor, a third terminal (out 90) connected

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to a first limiter diode (875), and a fourth terminal (out 0) connected to a second limiter diode (874) (see the admitted prior art, figure 5, and Vagher, figure 8).

–Regarding to claim 7, the admitted prior in view of Vagher teaches a second directional coupler (843), said second directional coupler having a first terminal (ISOL) connected to the first limiter diode, a second terminal (in) connected to the second limiter diode, a third terminal (out 90) connected to the second amplifier, and a fourth terminal (out 0) connected to a terminating resistor (see the admitted prior art, figure 5, and Vagher, figure 8).

–Regarding to claim 8, as similarly applied to claims 1, 6 and 7, the admitted prior art (see figure 5 and page 1, line 23 to page 4, line 1 of the specification) teaches a transmitting/receiving module comprising:

a first amplifier (53) which amplifies a transmission signal in a transmit path;

a second amplifier (56) which amplifies a receiving signal in a receive path;

in which the transmission signal is radiated into an air from a radiator (55) externally arranged in association with the transmitting/receiving module and the receiving signal is received by the radiator; and a circulator (54) having a first terminal, a second terminal and a third terminal, wherein the transmission signal outputted from the first amplifier is inputted to the first terminal, the receiving signal is received by the radiator connected to the second terminal, the third terminal is connected to the second amplifier via the circulator.

The admitted prior art does not teach a low reflection limiter provided on an input side of said second amplifier, provided between the circulator and the second amplifier, as claimed.

Vagher teaches a low reflection limiter (850) which is capable of limiting (by switching off) an unselected input signal received from an input terminal (in) of device (823) of the low reflection limiter for flowing into an output path (LOW POWER PATH) at an output terminal (out 90) of device (843) of the low reflection limiter, (see col. 5, line 61 to col. 6, line 32, col.7, lines 45-58).

In the admitted prior art, the transmitting/receiving module operates in a transmit mode when switch (52) switching to a transmitting side (Sa) of the transmit path for transmitting a transmitting signal onto the circulator (54) and the antenna (55), and in a receiver mode when switch (52) switching to a receiving side (Sb) of the receive path for receiving a return signal received from the antenna and the circulator (see figure 5 and page 1, line 23 to page 4, line 1 of the specification). In the admitted prior art, the second amplifier (56) in the receive path is vulnerable for receiving some possible leakage power of the transmitting signal being leaked through circulator in Y direction during a transmit mode (see page 2, lines 5–11), wherein these leakage power, as a signal received by the second amplifier and if large enough, might cause damage to the second amplifier (56) (see page 3, lines 12–16).

It would have been obvious for a person skilled in the art to implement the admitted prior art with a low reflection limiter, as taught by Vagher, in such a way that a low reflection limiter provided on an input side of the second amplifier, between the second amplifier and the circulator, with its input terminal connected to the circulator for receiving a receiving signal and its

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output terminal connected to the second amplifier, wherein the low reflection limiter would be configured to limit (by switching off) leakage power of the transmitting signal being leaked through circulator during a transmit mode for flowing into the second amplifier so that possible damages which might be caused to the second amplifier by these power leakages would be avoided.

-Regarding to claim 11, the admitted prior art in view of Vagher teaches that said low reflection limiter comprises a first directional coupler (823), said first directional coupler having a first terminal (in) into which the receiving signal is inputted, a second terminal (ISOL) connected to a terminating resistor, a third terminal connected (out 90) to a first limiter diode (785), and a fourth terminal (out 0) connected to a second limiter diode (874) (see the admitted prior art, figure 5 and Vagher, figure 8).

-Regarding to claim 12, the admitted prior art in view of Vagher teaches a second directional coupler (843), said second directional coupler having a first terminal (ISOL) connected to the first limiter diode, a second terminal (in) connected to the second limiter diode, a third terminal (out 90) connected to

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the second amplifier, and a fourth terminal (out 0) connected to a terminating resistor (see the admitted prior art, figure 5, and Vagher, figure 8).

Allowable Subject Matter

9. Claim 13 is allowed.

Regarding claim 13, none of prior art of record teaches or suggests a transmitting/receiving module comprising a first directional coupler having a first terminal connected to a terminal of a circulator, a second terminal connected to a terminating resistor, a third terminal connected to a first limiter diode, and a fourth terminal connected to a second limiter diode, a second amplifier connected to the first limiter diode for amplifying a receiving signal; a third amplifier connected to the second limiter diode for amplifying the receiving signal; and a second directional coupler having a first terminal connected to the second amplifier, a second terminal connected to the third amplifier, a third terminal into which a combined signal which is amplified by the second amplifier and the third amplifier is inputted, and a fourth terminal connected to a terminating resistor.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kawakami et al (5,748,139), Couvillon et al (3,859,609).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sanh D. Phu whose telephone number is (571)272-7857. The examiner can normally be reached on M-Th from 7:00-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on (571) 272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

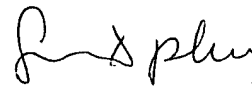
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Sanh D. Phu
Examiner
Division 2618

SP

4/11/06



**SANH D. PHU
PATENT EXAMINER**